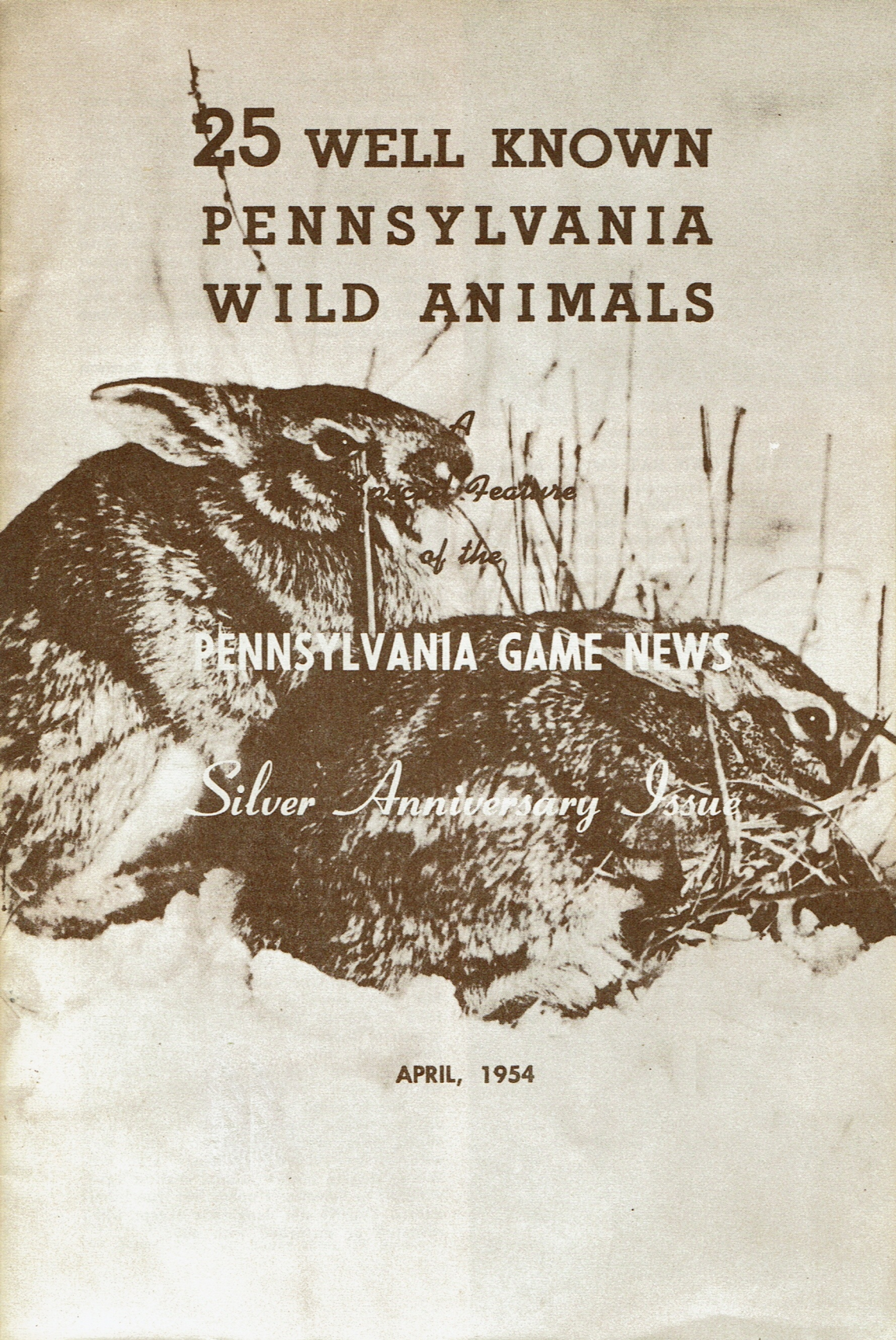




25 WELL KNOWN PENNSYLVANIA WILD ANIMALS

*A
Special Feature
of the*

PENNSYLVANIA GAME NEWS

Silver Anniversary Issue

APRIL, 1954



OPOSSUM (*Didelphis virginiana*)

Weighs up to 14 pounds. Lives almost anywhere in open woods, swamps, wastelands. Makes nest of leaves in fallen log, hollow tree, or woodchuck burrow. Does not hibernate. Up to 18 young born about 12 days after mating; smaller than honey-bee at birth. Live in mother's abdominal pouch (marsupium) four to six weeks; attached to 13 teats. Remain with mother about three months. Feeds on almost any organic matter—fruits, berries, earthworms, insects, frogs, snakes, birds, small mammals, eggs, corn, nuts. Fur used mostly for trimmings. Flesh relished by some.

Hal H. Harrison

PGC Photo by Cady

LITTLE BROWN BAT (*Myotis lucifugus*)

Only flying mammal in world. Found throughout the state; flies most at hour of sunrise and sunset. Mates in fall but single young not born until mid-June to mid-July. Newborn bat remains hidden in some dark retreat while parent forages in evening; nurses two to three weeks, then takes wing to capture own food. Adults feed entirely on insects, make up to 30 mile flights from home roost. Spend winters sleeping in buildings, mine shafts, caves; may perform short migrations. Flying bats detect obstacles in path by emitting supersonic notes and hearing these sounds when they bounce back from obstacles. Bats are harmless but droppings have disagreeable odor. May be kept out of buildings by boarding up entrance holes or by sprinkling retreat with several pounds of naphthalene flakes.



PGC Photo by Cady



BLACK BEAR (*Euarotos americanus*)

Adults average 200-300 pounds. Pennsylvania record 633 pounds live-weight; 538 pounds hog-dressed; length, nine feet; killed December 4, 1923 near Milford, Pike County. Found in wooded sections of state but may enter farmlands when natural food is scarce. May range many miles in search of food. Fond of fruits and berries, honey, nuts, ants. Mates in June; 14 young born in late January or early February while mother is in winter sleep. Young are blind, weigh no more than 8 ounces, are practically hairless. Adult females bear young only every other year; cubs stay with mother through summer and fall. Winter den in hollow stump, shallow cave, windfall or sometimes open. Not true hibernators. Usually not dangerous except when cornered or disturbed with cubs.

NORTHEASTERN MINK (*Mustela vison*)

Length to 25½ inches; weight of male 1½ to 2½ pounds, females lighter. Usually found near waterways; may roam woods in winter. Makes den under large tree, in muskrat lodge, or in natural cavities along stream banks. Mates mid-February to early March; 4-8 young born 42-44 days later. Young blind, naked; weaned at 5 weeks. Both parents help raise young; family disperses in early fall. Diet includes fish, frogs, aquatic insects, snakes, small mammals, some birds. Strong scent glands. One of most valuable furbearers; many now raised in captivity at fur farms.



Maslowski & Goodpaster from
National Audubon Society



Allan D. Cruickshank from
National Audubon Society

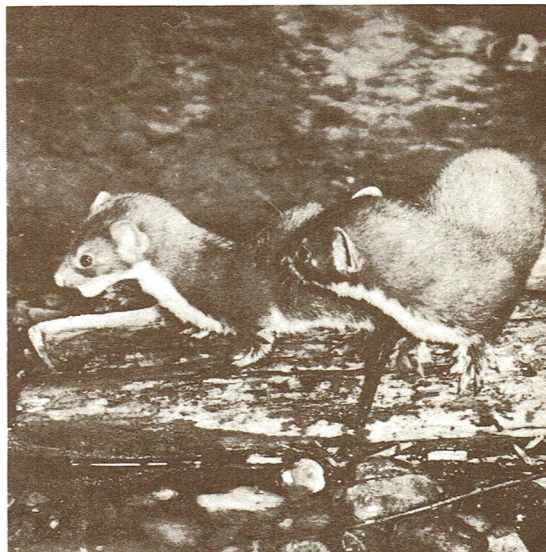
RACCOON (*Procyon lotor*)

Adults average 15-18 pounds, may weigh 30 or more. Found wherever woods, swamps and streams provide food and den sites; usually dens in hollow tree. Active almost entirely at night. Excellent climber; descends either head or tail first. Spends early winter sleeping but not a true hibernator. Breeds in late January or early February; 3 to 6 young born early April. Eyes open at three weeks; family remains together until late fall, often into winter. Feeds on wide variety of foods; particularly fond of crayfish, fruits and berries, nuts, grains, crickets, grasshoppers, corn. Does not always wash food. Desperate fighter when cornered but young tame easily. Valuable furbearer but classified as game animal in Pennsylvania. Fur is thick and durable, widely used in manufacture of coats and trimmings.

Maslowski & Goodpaster

NEW YORK WEASEL (*Mustela frenata*)

Males up to 24 inches in length; females to 13 inches. Weigh up to 12 ounces. Some turn white in winter, except for black tail tip; called ermine, change occurs in November, again in March. Prefers fairly open country; found in sparsely wooded second growth thickets, along waterways, sometimes in marshes. Make dens in shallow burrows, underneath stumps, in banks of gullies. 4-8 young born about April; both parents help raise young. Chief food is field mice but diet may also include cottontail rabbits, chipmunks, shrews, small birds, poultry, snakes, frogs, and insects. Do not suck blood; have strong scent glands. Cover several miles in search of food at night but home range not more than 100 acres.



EASTERN SKUNK (*Mephitis mephitis*)

Length to 20 inches; weight to 10 pounds. Found in agricultural areas mostly. Digs own den or may use woodchuck burrow; makes nest of dried grass where one to several animals spend day. Sleeps in severe winter weather but becomes active in mid-February mating season. 4 to 7 young born 51 days after mating; are nursed for 6-7 weeks; leave nest with mother in June. Male may rejoin family in July. Feeds on wide variety of insects, fruits and berries, mice, grains, bird eggs. Scent is world famous but glands are used only in times of great danger. Can give scent when being held by tail but liquid is not blinding.



Rex Gary Schmidt



Maslowski & Goodpaster

WOODCHUCK (*Marmota monax*)

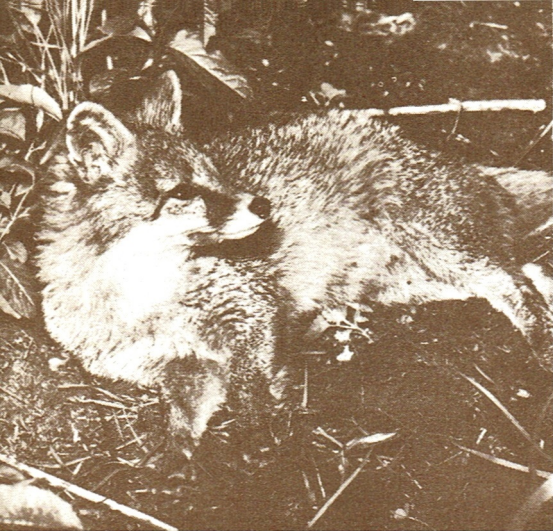
Length to 27 inches, including 6 inch tail. Weight to 12 pounds. Prefers slightly rolling country, interspersed with ridges, in farmland; may be found in woods. Den is extensive soil burrow, having two or more entrances, down to five feet, deep, extending 30 or more feet. Can climb trees and can also swim. Hibernates in winter, emerging in late February or early March. Mates in mid-March; after 28 day gestation period 2-6 young are born. Young are blind, naked, about 4 inches long, and weight about an ounce. Crawl at 3 weeks, leave den at 1 month. Principal foods are grasses, clover, alfalfa, plantain, various perennials; also fond of beans, peas, other vegetables, corn, apples. Whistles when alarmed. Burrows protect rabbits; flesh edible. Ground-hog day, February 2, not based on fact.

PGC Photo by Cady

NORTHEASTERN OTTER (*Lutra canadensis*)

Length to 3 feet, tail one foot. Weight between 12 and 15 pounds. Feet webbed. Expert swimmer and diver; can travel quarter-mile beneath surface before coming up for air. Loves to play in water or slide on ice or clay slopes. Travels readily overland; home range may cover 50 miles. 2-3 young usually born from mid-April to early May, gestation period about 10 months. Den usually burrow beneath tree roots along lake or stream. Family stays together for one year; young have to be taught how to swim. Food mainly fish, also crayfish, frogs, mussels, insects. Pelt is thick, lustrous; most durable native American fur. Becoming rare in Pennsylvania.





GRAY FOX (*Urocyon cinereoargenteus*)

Length to 40 inches, including 12 inch tail. Weight 7-11 pounds, to 14 pounds rarely. Found in wooded areas, swamps, but does not like farmland as well as red fox. Good climber. Den in rocks, hollow tree or log. Mates from January to February; 2-7 young born 63 days later. Family breaks up in August-September. Feeds much on cottontail rabbits; also eats field mice, shrews, nuts, fruits, birds, insects, some carrion. Fur used for collars and trimmings; less valuable than red fox.

PGC Photo by Batcheler

Maslowski & Goodpaster

RED FOX (*Vulpes fulva*)

Length to 41 inches, including 16 inch tail. Male larger than female. Average adult weight 10 to 11 pounds; rare individual to 14 pounds. Prefers rolling farmland, mixed with wooded areas, marshes and streams. Mates January-February, 4-10 young born 51 days later. Pups stay in den 3-5 weeks, leave it permanently at about 3 months. Family group disperses in August. Den often in wooded slope, may in open field; sometimes a remodelled woodchuck burrow. Winter food mainly mice, rabbits, some birds, apples, dried berries; spring and summer food woodchucks, poultry, rabbits, birds, eggs, berries, fruit, insects. Population may remain high despite intensive hunting and trapping. Fur widely used for trimming and scarfs; 40% as durable as otter.

PGC Photo by Cady



BOBCAT (*Lynx rufus*)

Length 30-35 inches, tail 6 inches. Weight 15-40 pounds. Found in wooded or brushy areas, seldom near farmland. Dens usually in rock recesses. Mate in late February 1-4 young born 50 days later. Young well furred at birth, open eyes at 9 days, weaned at about 2 months. Remain with mother through summer. Feed on snowshoe hares, squirrels, mice, muskrats, grouse, carrion. Large bobcat capable of killing full-grown deer, but bobcat population is so low that over-all effect on deer herd is negligible.



Allan D. Cruickshank from
National Audubon Society

CHIPMUNK (*Tamias striatus*)

Length to 9½ inches, tail 3¼ inches. Found in open woods; frequents stone walls, half-rotted logs, thick underbrush. Excellent climber. Burrows are lengthy, complicated, cover 30 feet or more. Sleep through winter but may emerge in warm spells. Mate in mid-March—early April; 3-5 young born 31 days later; two litters possible. Young stay with mother until 3½ months old. Principal foods are small seeds, berries, fruits and nuts; also will eat small birds, mice, snakes, snails, slugs, insects. Home range 2-3 acres. Tame easily.

GRAY SQUIRREL (*Sciurus carolinensis*)

Length 18-20 inches, including 9 inch tail. Weight ¾ to 1½ pounds. Black squirrel is color phase; albinos also occur. Found everywhere in woods, city parks, farm woodlots. Den in natural tree cavities but may also build bulky outdoor nest of leaves, twigs. Mate in mid-winter; 1-4 young born about 44 days later; may have second litter in fall. Young can leave nest at 6 weeks. Feed mostly on acorns, chestnuts, hickory nuts; also eats buds, various fruits and berries, occasional insect. Stored food located later by scent. Mass migrations sometimes occur, probably because of overcrowding rather than lack of food.

Allan D. Cruickshank from
National Audubon Society



E. P. Haddon, Fish & Wildlife Service



RED SQUIRREL (*Tamiasciurus hudsonicus*)

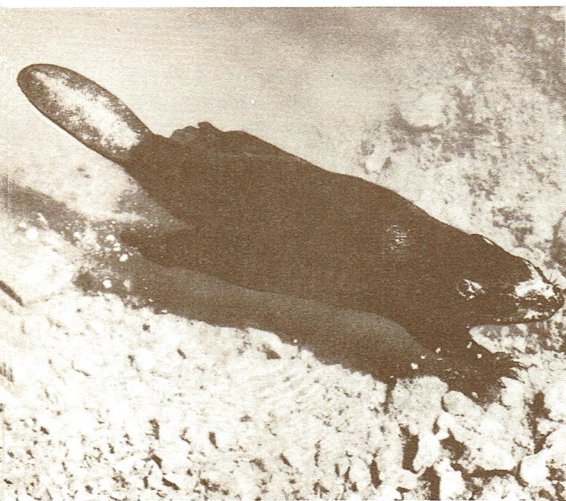
Length to 12½ inches, including 4¾ inch tail. Found everywhere; spends great deal of time on ground; favors evergreen forests. Active almost year round. Mates February—March; 3-6 young born in about 40 days; eyes open 27th day; young weaned when less than 5 weeks old; two litters a year. Principal foods include nuts, berries, maple and elm buds, conifer seeds, many species of fungi, occasional nestling or clutch of eggs. Sometimes causes damage to urban shrubs and trees by stripping bark of cedar trees.

FOX SQUIRREL (*Sciurus niger*)

Length 20-25 inches, including 12 inch tail. Weight to 3 pounds. Found in semi-open woods of oak type; often occupies farm woodlots. Builds shelter of leaves for summer home; spends winter in tree cavity or builds more elaborate structure of leaves, bark, twigs. Mate in January 1-4 young born 44 days later; develop slowly and leaves nest at 6 weeks. May have two litters per year. Principal food consists of nuts and other tree fruits. Does not hibernate.



Allan D. Cruickshank from
National Audubon Society



OPL Photo by Rex Gary Schmidt

BEAVER (*Castor canadensis*)

Weigh up to 60 pounds; length to 45 inches, including tail 16 inches long, 5 inches wide. Found on suitable waterways throughout state, often surprisingly close to cities. Mates late January-February; 1-8 young born about 3 months later; young remarkably well developed at birth; leave lodge at one month, stop nursing at 6 weeks. Feeds entirely on plants, largely bark of aspen; also found of maple, willow, alder, apple, birch bark, some aquatic plants. Builds excellent dams and houses but may live in bank burrow. Tail not used for building purposes. Very valuable furbearer; pelts worth \$75 or more some years.

PGC Photo by Cady

FLYING SQUIRREL (*Glaucomys volans*)

Length to 9½ inches, including 4½-inch tail. Found in wooded areas throughout state but not often seen because it is entirely nocturnal. Cannot actually fly but glides from tree to tree; can cover over 150 feet in one glide, turn at right angles in "flight". Mates in late February—early March; 2-6 young born 40 days later. Second litter produced in July-August. Feeds on usual variety berries, nuts, other tree fruits, insects; also will eat flesh—mice, small birds.



PENNSYLVANIA MEADOW MOUSE

(*Microtus pennsylvanicus*)

Length to 7 inches; with $1\frac{1}{4}$ inch tail. Very widespread in state; found in low meadows, swampy pastures, dry fields, forest openings. Cyclic; in 3-4 years build up to high; may be 200 mice per acre in favorable habitat. Bred almost year round; up to 17 litters of 3-10 young; 3 week gestation period; young weaned 10-12 days. Feeds on almost any type vegetation; girdles trees; may eat more forage in U. S. than domestic cattle; consumes more than own weight in green food every day. Active year round.



Karl H. Maslowski



MUSKRAT (*Ondatra zibethica*)

Length to 25 inches, including 10 inch tail. Weight to 3 pounds. Found in waterways and marshes throughout state. Builds lodge of marsh vegetation or lives in bank burrows; lodges harbor up to 10 or more animals. Mates in March; 3-8 young born 29-30 days later; may have several litters per year. Feed on aquatic vegetation, roots and stalks of cattails, three-square grass, sagittarias; fresh water clams; some fish and crustaceans. Most valuable of all furbearers; pelts were known as Hudson seal, Russian otter, red seal, river mink; 45% as durable as otter.

Maslowski & Goodpaster

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PORCUPINE (*Erithizon dorsatum*)

Length to 36 inches; tail 6 inches. Average adults weigh 10-20 pounds. Found in deeply wooded sections of northern counties. Mates in November; 1-4 young born 16 weeks later; eyes open at birth, 11 inches long, weighs about a pound (twice size of newborn bear), can climb second day. Feeds almost entirely on vegetation—ever-green foliage, tree bark, water plants. Cannot throw quills; does not hibernate. Does some damage by girdling trees.





VARYING HARE (SNOWSHOE RABBIT) (*Lepus americanus*)

Length to 18 inches; tail 2 inches; hind feet 5½ inches. Weight 3-5 pounds. Forest species; prefers brushy semi-open tracts surrounded by evergreen forest, dense cedar swamps, laurel thickets. Mates in June; 1-6 young born 36 days later; probably more than 1 litter per year. Cyclic species; population high about every 10 years. Feeds on aspen, conifers, dandelions. Home territory about 10 acres; excellent game species.

Jack Dermid from National Audubon Society

PGC Photo by Cady

COTTONTAIL RABBIT (*Sylvilagus floridanus*)

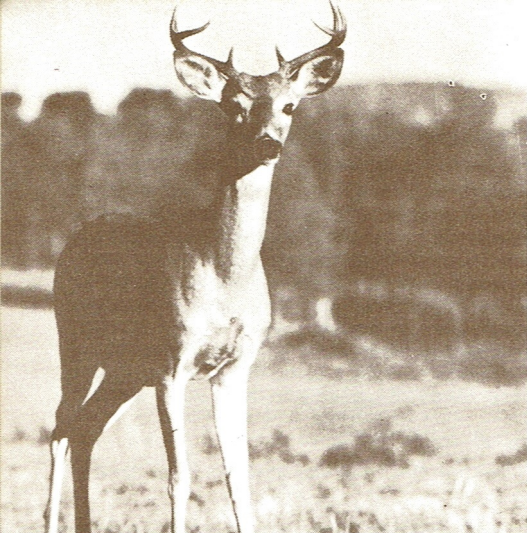
Length 15-18 inches, tail 2 inches. Weight 2½-3 pounds. Occupies diverse habitat, from swamps to upland thickets; not usually found in deep forest. Spends day in "form"—nest-like depression in grass, brush, etc. May utilize woodchuck burrow but seldom digs own. Home territory no more than 32 acres. Mates March-June; 2-9 (average 4-5) young born 30 days later; 3-5 litters per year; young leave nest before 3 weeks. Feed on variety of plants; chiefly grasses and low broad-leaved weeds in summer, buds and tender twigs of many small trees and brush in winter; food of sumach bark. Most popular game in Pennsylvania.

William M. Rittase



ELK (*Cervus canadensis*)

Length: bull to 9½ feet, cow to 7½ feet. Height at shoulder to 5 feet 8 inches. Average male weight 700-1000 pounds; female 500-600 pounds. Bull has great rack, to 5 feet long; shed every year. Last native Pennsylvania elk killed 1869; present herd started by stocking western elk Clearfield and Clinton Counties 1913. Present day herd found Cameron County, few in Elk and Forest. Breeds September-November; 1 or 2 calves born 249-262 days later; weigh about 30 pounds at birth; weaned in October. Feeds by grazing or browsing twigs, leaves, grasses, etc. Completely protected in Pennsylvania.



E. P. Haddon, Fish and Wildlife Service

WHITE-TAILED DEER (*Odocoileus virginianus*)

Length to 6½ feet; height at shoulder to 4 feet; weight average adult bucks 100-200 pounds, does 90-150 pounds. Found throughout state; individual range usually not more than 1 square mile. Breeds October-December, peak in November; 1-3 fawns born 205-212 days later; weigh 4-5 pounds at birth; nursed every 4 hours; weaned at 4 months. Food largely browse—twigs, buds of maples, birch, viburnums blueberries, some conifers. Also eats nuts, fruits, some grasses, water plants. Speed to 30 m.p.h.; can jump 8 feet high, 30 feet horizontal. Most popular Pennsylvania big game animal.

WANT TO HELP WILDLIFE?

25 Things You Can Do

1. Plant shrubs and other plants to provide food and cover.
2. Build and erect squirrel nesting boxes.
3. Build brush piles to provide cover for rabbits and other small animals.
4. Plant hedgerows and fencerows that provide food and cover and serve as travel lanes.
5. Make woodland openings to encourage plant growth and insect life for wildlife.
6. Cut browse for deer in winter.
7. Plan and set-up a wildlife conservation exhibit in your school, local club, or other community center.
8. Make and distribute posters urging people to save our wildlife.
9. Make plaster casts of animal tracks and exhibit them.
10. Make a spike-board feeder, place ears of corn on spikes, and place in woods for squirrels.
11. Make and distribute forest fire prevention posters.
12. Organize and train a forest or field fire fighting crew.
13. Contact your local Game Protector. Ask him if you can help in some of his regular duties such as carrying out winter feed, brushing out refuge lines, etc.
14. Prune apple or other fruit trees on abandoned farms so as to encourage more food for wildlife.
15. Build a nature trail and conduct guided tours to teach others the value of wildlife.
16. Practice and teach good gun handling and field safety. Teach others "sure shot—no cripples."
17. Gather up acorns or other nuts from city parks, other urban areas and plant them in the woods or on farm woodlots.
18. Help in the Game Commission's cottontail rabbit live trapping and transfer program; see your local Game Protector for details.
19. Help build a dam or other device to regulate and manage a marsh area.
20. Build artificial den sites for rabbits, other furbearers.
21. Control predators by trapping for foxes, skunks, raccoons, opossums.
22. Learn how to call great horned owls and hunt them. Best time is from June to October.
23. Give a talk on wildlife conservation before your class in school or any other civic group.
24. Encourage and help build farm ponds as homes for such wild animals as muskrats, mink, etc.
25. Encourage farmer friends to use soil conservation practices, especially plowing on the contour.



Game Management Depends On You!

By Will Johns

Editor, Pennsylvania Game News

What Is Game Management?

IN simple terms, game management is "the art of making land produce sustained annual crops of wild game for recreational use." Its primary objective is to improve hunting and provide more game for landowners and sportsmen.

Game management may sound like a complicated subject. Professional game managers who receive college degrees in this field go through a course of study that sounds like a scientific nightmare—zoology, botany, ecology, ornithology, parasitology, animal pathology, and many more technical subjects. Yet neither they nor anybody else knows all the answers to the problems of game management. And the amazing thing about this important and popular subject is that its success depends very much on YOU!

It's true, of course, that many people are trying to manage game. State and federal conservation departments, many business and professional societies, sportsmen's clubs, youth groups and countless others are devoting all or much of their time and talents to protect and provide more wildlife. But there are still many things that you, as an individual, can do to help.

If you are willing to spend some of your spare time outdoors, to roll up your sleeves and work, to accept advice and suggestions from those who know more about the subject than you do—if you have the ability to win friends and influence people and, above all else, the sincere desire to do something constructive for conservation, then you, too, can be a game manager. In fact, you can be the BEST game manager conserva-

tion ever had.

This article is designed to suggest ways in which you, personally, can help in sound game management. It contains basic information which will enable the average individual or group to provide more game and better hunting for the future.

If you own a farm, tract of forest land, or other large area away from city or town, there is ample opportunity to put game management to work. But even if you live in a city apartment, chances are you know someone who does own land in hunting territory. Just ask his permission, enlist his cooperation and support, and go to work.

Why Game Management?

Game management, when you get right down to it, is actually land management. True, there are laws and rules and regulations which control the harvest of game but this is only one phase of management. Such restrictions, by themselves, do not directly produce game.

Wild birds and animals result from just two things—the ability of the species to reproduce and the capacity of the land to keep wildlife populations alive. And the capacity (usually called “carrying capacity”) of any given unit of land also depends primarily on two things—food and cover. The amount, quality and distribution of wildlife food and cover plants actually determines how much game can be produced and maintained.

Are there limits to this production? Well, let's suppose that there are no limiting factors, that the potential high rate of increase in all wild animals and birds is allowed to work unchecked. We will eliminate all causes of death, provide suitable food in ample amounts, control the weather to maintain ideal temperature and water conditions. Now let's take a pair of cottontail rabbits, place

it in this hypothetical “happy hunting ground,” assume the female will bear 20 young each year and watch them build a theoretical, but mathematically possible, rabbit population. Here's what would happen:

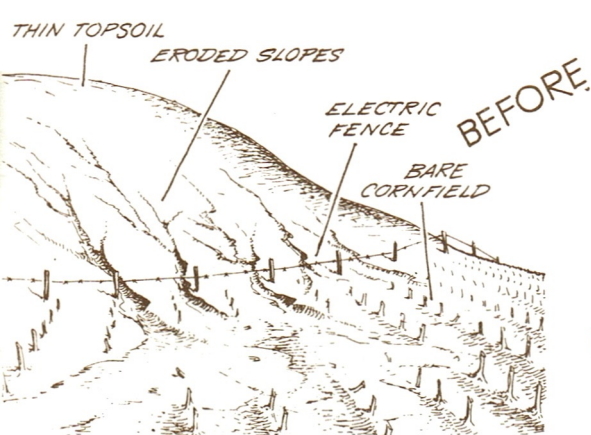
	Rabbits
End of 1st year	22
End of 2nd year	242
End of 3rd year	2,662
End of 4th year	29,282
End of 5th year	322,102
End of 6th year	3,543,122
End of 7th year	

Figure omitted to conserve paper!

Obviously, this fantastic growth in rabbit populations never takes place in the wild. Nature's laws rule out any such results from rabbit multiplication. There are normally many factors which hold down game populations. Predators, disease and parasites, human activity (hunting, farming, forestry, industry, pollution, etc.), weather conditions, lack of food and shelter—all these combine to limit wild game numbers. Occasionally, a wild bird or animal may die of old age but they are very much the exception to the rule. The average newborn young of any small game species lives less than a year; those of big game animals probably less than 3 years.

The significant point, however, is that YOU can reduce the effects of all these limiting factors except one—weather. And even the effects of weather can be modified. We can do all this through our use of the land, by providing more and better food and cover for wildlife. Given suitable nourishment and shelter, game birds and animals can escape most predators, can resist many diseases and parasites, and can live through all but the worst weather.

The way to game abundance, then, is a man-made way. The keys are FOOD and COVER. The time to use these keys is NOW!



Where Do We Start?

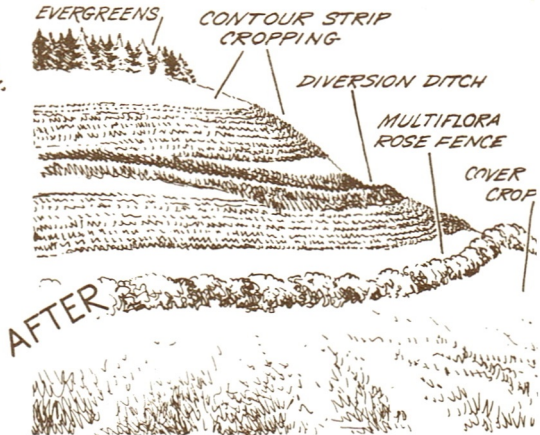
The first and only place to practice game management is right on the land—your land, the farm where you hunt rabbits and ringnecks, the mountain around your deer camp—in fact any land that is not covered with civilization's structures of cement, wood and steel.

Let's take cultivated land first. In Pennsylvania there are over 7,000,000 acres under cultivation, almost one-fourth the total area of the state. This the land upon which the farmer grows his crops—corn, wheat, potatoes or anything else for which there is a market.

What can be done with this cultivated land to make it produce more wildlife? Can we change farming methods and crop marketing so that game birds and animals are given a better chance of survival? Should any game manager try to alter good farm management plans and practices to produce more game and better hunting?

The hard truth is that all these questions must be answered with a qualified, but emphatic, NO! Why? Because modern farming is already based on conservation. Most farmers today, if they really want to be successful and earn as much from the land as possible, are using cultivation methods that automatically produce more game. Some of these methods—the ones valuable from a game management viewpoint at least—are:

Crop Rotation consists of growing different crops in a regular sequence.



The farmer rotates the crops grown on a given field because he wants to keep the soil from eroding and also because it results in higher crop yields per acre. How does this help game? It puts more vegetation on the land for a greater part of each year, thus providing more food and shelter for wildlife.

Contour Strip Cropping protects fields from loss of soil by alternating strips of close-growing crops like clover with strips of cultivated row crops like corn. Parts of a strip-cropped field remain in cover most of the year, giving the field a much greater carrying capacity for wildlife than the same field planted to one crop.

Winter Cover Crops are seeded in corn, potatoes or other row crops after the last cultivation. The resulting green growth and ground cover protects the soil and also provides important food and cover for wildlife.

Diversion Ditches are shallow, broad ditches dug across sloping fields to carry off surplus water and protect fields below from erosion. They are usually seeded to a permanent type grass-clover mixture and are mowed to maintain a tight sod. These sod strips become travel lanes and nesting cover for wildlife.

Woodland Management on modern farms has timber production as the primary objective but also involves practices beneficial to wildlife. Good forestry requires all trees except "den" trees should be harvested when they reach maximum growth. An uneven-age stand is the result; wild-

life benefits from the better food and cover conditions which naturally occur. Keeping livestock from grazing in woodlots and providing year-round fire protection are two other practices important to production of both timber and game.

Orchard Management, as practiced by "conservation" farmers, includes the planting of cover crops like sweet clover, ryegrass and millet to protect and improve the soil. Pure ladino clover is often seeded and maintained as a permanent sod cover in apple orchards. These cover crops increase the value of the orchard and at the same time become food and cover for wildlife.

Evergreen Plantations are being made on many farms today to give farmers an additional cash crop of "Christmas" trees. Such plantations furnish excellent wildlife cover.

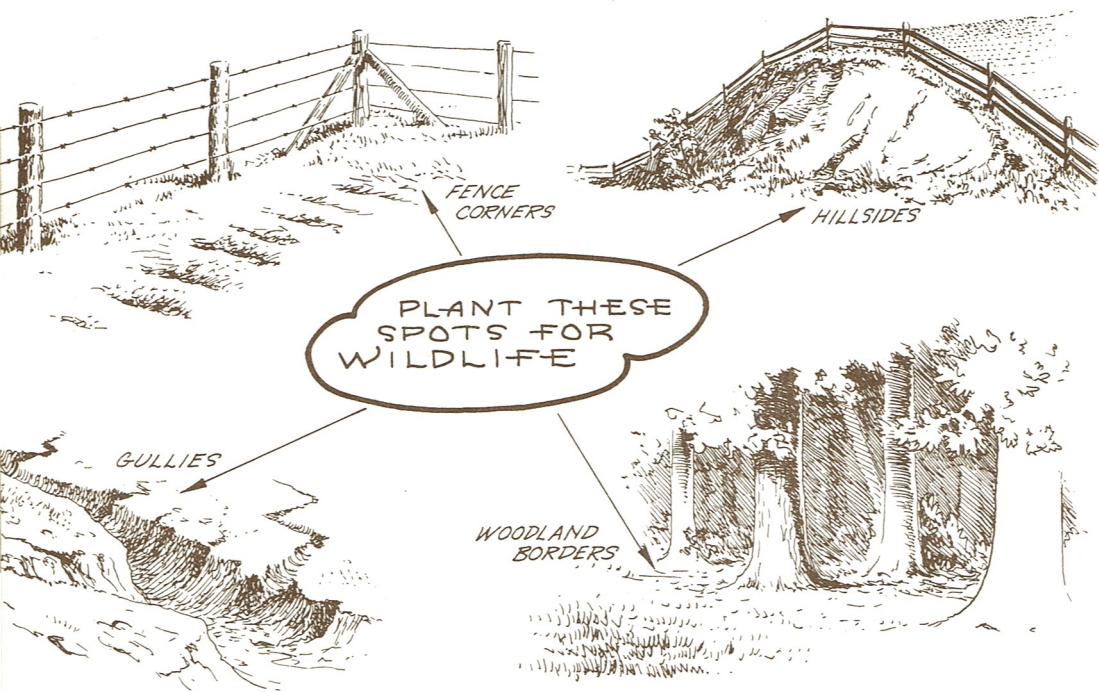
All these uses for farmland are aimed at conserving the soil, protecting the water supply and increasing the yield of field and woodland crops. They mean more money in the bank for the farmer which, after all, is his primary consideration. Sure, most

farmers like to have wild birds and animals living on their land but in our modern world, first consideration must be given to earning a living.

Here's where you, as a game manager, come into the picture, however. If the farmer on whose land you are going to work is not already a "conservation" farmer—if he doesn't use crop rotation, strip cropping, winter cover crops and all the rest—convince him that these practices really mean more money for him, that a complete, modern land-use plan for his farm will pay-off. Contact your local Soil Conservation District representative, your game protector, fish warden, agricultural extension agent and district forester for help and advice.

The Land Left-Over

Now we've taken care of cultivated land, the fields and forests on any farm that are producing the food and fiber so essentially to mankind. Most of the land on a modern farm will be under cultivation. But there is always some land left-over. This is the land on which the farmer simply cannot grow crops. Maybe it's a hill-side



too steep for tractor and plow, perhaps it's a marsh area, a pond, a rock out-crop, even bits of good land that are cut off from the rest of a field by a stream, drainage ditch or gully.

Yes, Pennsylvania has over seven million acres under cultivation but there are over 15,000,000 acres in total farmland. What's happening on those other 8,000,000 acres? What's happening on all that "left-over" land? Much of this vast area is just lying idle, not because anyone is at fault but simply because it's not economical nor practical to apply modern farming methods to it. And much of this land is or could be "wildlife land." Let's take a look at some of it and let's go to work!

Drainage-ditch and Stream Banks are "naturals" for wildlife. Water is present and food is usually near in cultivated fields. Unprotected, these banks are subject to erosion. Good soil is often robbed from cropland after every heavy rain storm. But seeded to a good grass-legume mixture, these banks will save the soil and at the same time be good for wildlife. A row of multiflora rose, spaced 3 feet apart, planted along the top of the bank will give added protection and increase wildlife food and cover. Shrubs, including bush honeysuckle, elderberry, red osier dogwood and silky dogwood may also be planted along bank tops. On the banks of larger streams, you can plant basket willow and shrubs like red osier dogwood, silky cornel, Russian-olive, nannyberry and highbush cranberry. Livestock should not be allowed to graze in these areas.

Fence Rows and Hedges are used on every farm to separate fields or to enclose pastures. The fence row most often seen today is made of barbed- or woven-wire, with single or double strand electric fences becoming more and more popular. From a game management standpoint, these "dividing lines" add little or nothing to living space for wild-

life. But from a crop production viewpoint, the farmer certainly can't be blamed for using such fencing. By doing so he can plant a few more rows of a "cash" crop. More and more, however, modern studies are showing that woody or brush fence rows have many advantages over the "clean" fences—advantages that may mean more profit in the long run. They harbor more beneficial birdlife than do grassy fences, are less expensive to plant and maintain, and are havens for game.

Now a new kind of fence is gaining popularity—a living fence of multiflora rose. It is capable of forming a livestock-proof barrier that requires no expensive wire, needs no pruning or trimming and doesn't sap soil fertility. Multiflora is attractive, makes good wildlife cover and provides some emergency wildlife food.

Marshes, when properly treated and managed, can be wildlife wonder areas. An acre of marsh may yield more actual cash in the sale of muskrat pelts than the same acre drained and put to the plow. Other marshes can be developed for waterfowl. Briefly, marsh management for wildlife consists of regulating water depth, preventing burning, halting grazing by livestock, and making plantings to improve the area. Plants you can use include reed canary grass around the edges and wet-site shrubs like silky dogwood, basket willow, red osier dogwood and highbush cranberry. If you want to manage the marsh primarily for waterfowl, plant such things as wapato (duck potato), wampee (duck corn), wild duck millet, sago pondweed, wild celery, wild rice, giant burreed, water shield and bulrush.

Farm ponds are usually constructed to serve as fish ponds and to provide fire protection to farm buildings. Their banks, however, can provide food and cover for wildlife when planted with wet area shrubs and vines. The shorelines can be planted

to aquatics for waterfowl and the entire area fenced with multiflora rose or other shrubs.

Shelterbelts and Windbreaks are planted in crop fields to help control wind erosion and the drying effect of wind on soil, or around farm buildings to protect them from winter wind and snow. By planting at least two rows of Norway spruce, Austrian, red, Scotch or white pine at 8 x 8 feet spacing in the center, and bordering these evergreens with two or more rows of Amur privet, Tatarian honeysuckle, or other shrubs spaced 3 to 5 feet apart, both a windbreak and a "wildlife production area" can be established.

Field Borders are narrow strips of cropland along the edges of woodland or fence rows. Large trees often shade these areas and crop growth is poor. This unproductive land, usually 25 to 35 feet wide, can be planted with low growing shrubs like bicolor lespedeza. You can also seed them to sericea lespedeza or to permanent type grasses and clovers.

Woodland Borders usually contain tall trees that shade cropland. By cutting and felling these larger trees, crop production can be increased. At the same time shrubs and vines that produce food and cover for wildlife will naturally become established or can be planted. Often the timber harvested from the borders will pay for the operation. Tops and limbs should be piled in the border to provide rabbit cover.

Odd Areas are places on the farm which cannot be cultivated, but upon which you can successfully practice game management. Rock out-crops, sink holes, old foundations, gullies, headlands (areas at the ends of fields where cultivating equipment is turned around), edges of roads and lanes, or any other small area of "waste" land can all be put into production of wildlife. These odd areas usually are not larger than 3 acres in size. Anything over that probably should be put into timber production, using only the edges for wildlife production.

This, then, is the land on which you have to work. It's the first and only place to produce more game, better hunting, and most of all the best in farming.

Game management is not easy. But it's definitely worth the work you must put into it.

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